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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,500	06/17/2005	Niels Christian Weihrauch	6495-0110WOUS	2963

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HARTFORD, CT 06103

EXAMINER
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MULLINS, BURTON S

ART UNIT	PAPER NUMBER
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2834

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/14/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary****Application No.**

10/539,500

**Applicant(s)**

WEIHRAUCH, NIELS CHRISTIAN

**Examiner**

Burton S. Mullins

**Art Unit**

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-5 and 12-18 is/are rejected.
- 7) ☒ Claim(s) 2,6-11 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1, 3-5 and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. (WO 01/06624) in view of Nakada et al. (JP 56-071442). Sasaki teaches a synchronous motor comprising a rotor with 21 axially extending receiving spaces 25 for permanent magnets 26 and with axially extending accommodating spaces (slots) 23 for conductor rods 24 (Fig.1, p.23, lines 5-16), wherein in at least one sector of the rotor the accommodating spaces 23 for the conductor rods 24 have a substantially elongate cross-section (Figs.1&2).

Sasaki does not teach that in the spaces' elongate cross-section sector, in a cross-sectional view, the accommodating spaces for the conductor rods are made to be curved along their longitudinal axis.

Nakada teaches a motor rotor 1 including accommodating spaces (rotor slots) 2A for the conductor rods and made to be curved along their longitudinal axis (Fig.6). This reduces the torque variation of the motor.

It would have been obvious to modify Sasaki and provide, in the elongate cross-section sector, in a cross-sectional view, accommodating spaces for the conductor rods which are curved along their longitudinal axis per Nakada since this would have reduced torque variation of the motor.

Regarding claim 3, in Nakada the distance between the accommodating spaces for the conductor rods 2A is constant (Fig.6).

Regarding claim 4, Nakada teaches the curved slots while Sasaki Fig.5 teaches accommodating spaces 33-39 for the conductor rods arranged along their longitudinal axis in such a manner that the distance of the accommodating spaces for the conductor rods to the rotational axis of the rotor, in a cross-sectional view through the rotor, increases from the neutral axis (near slot 33) in the direction of the magnet axis (near slot 39).

Regarding claim 5, Nakada's curved slots, when combined with Sasaki, would teach "in a cross-sectional view through the rotor, the curvature of the accommodating spaces for conductor rods in the at least one sector is such that a radial outer end of each accommodating space for conductor rods is turned toward the magnet axis, so as to be closer to the magnet axis than if the accommodating spaces for conductor rods were not curved along their longitudinal axis" since Nakada's curved slots would be turned in relation to Sasaki's magnetic axis, their radial outer ends turned toward the magnet axis.

Regarding claim 12, Sasaki's rotor has at least one transition zone or barrier 27 in which the accommodating spaces for the conductor rods are not curved since they prevent shortcircuiting of the flux developed between neighboring opposed poles (p.32, lines 12-15).

Regarding claim 13, in both Sasaki and Nakada, the accommodating spaces for the conductor rods are closed on the radial outside.

Regarding claims 14 and 16, see Sasaki Fig.24 which shows a stator comprising a plurality of windings, and rotor is arranged to be rotational inside the stator.

Regarding claims 15 and 17, in Sasaki short-circuit rings 44a (Fig.14) are arranged on the front sides of the rotor, said short-circuit rings connecting the conductor rods 43 with each other.

Regarding claim 18, Sasaki's magnets inherently generate a rotating magnet field with a magnetic axis and a neutral axis due to the permanent magnets' positioning in Fig.1, for example.

### ***Allowable Subject Matter***

3. Claims 2, 6-11 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2, the prior art does not teach or suggest several permanent magnets, located so that they generate a rotating magnet field with a neutral axis and a magnet axis, the curvature radii of the accommodating spaces for the conductor rods decreasing from the neutral axis in the direction of the magnet axis.

Regarding claim 6, the prior art does not teach or suggest that in a cross-sectional view each accommodating space for the conductor rods has two side walls, which have different curvatures.

Regarding claim 10, the prior art does not teach or suggest that the receiving spaces for the permanent magnets are curved and arranged around the rotational axis of the rotor in such a manner that in a cross-sectional view through the rotor the distance between the receiving spaces for the permanent magnets and the accommodating spaces for the conductor rods is larger in the area of the magnet axis than in the area of the neutral axis.

Regarding claim 19, the prior art does not teach or suggest that in a cross-sectional view each accommodating space for the conductor rods has two side walls, which are curved in a similar direction.

### ***Response to Arguments***

4. Applicant's arguments filed 01 December 2006 have been fully considered but they are not persuasive. Regarding the rejection of claims 1 and 16 over Sasaki in view of Nakada, applicant argues that it is the “disposition” and not the “shape” of Nakada’s curved slots in Fig.6 that “[obtain] averaged torque at the motor” (Nakada, abstract) since the uncurved slots of Figs.3&4(B) have the same effect. This is not persuasive because the curved “shape” in the Fig.6 embodiment is necessary to achieve the particular “disposition” shown in this embodiment. In other words, the curved shape of a slot 2A in the Fig.6 embodiment is inherently the slot’s “disposition”, so that one end of the slot intersects with a radial line 3A from the rotor core 1 (see translation, p.6). This contrasts with the embodiment in Figs.3&4B, where the slots are not curved and thus “contact with” rather than “intersect” the radial lines 3A (translation, p.5)

Regarding the argument that since the non-curved embodiment in Figs.3&4B has the same effect and suggests that neither an uncurved or curved slot shape is better than the other, and therefore fails to provide motivation for the curved slot shape embodiment of Fig.6, this is not persuasive because first, the Nakada reference is considered in its entirety, for all it discloses. Thus, both the curved and uncurved embodiments are relevant. It has been held that “the prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage

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the solution claimed...." *In re Fulton*, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004). Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." *In re Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). Further, a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied*, 493 U.S. 975 (1989).

Secondly, as far as the lack of motivation, it is noted that the motivation for providing the curved slot shape of Nakada Fig.6 is the same as that for the non-curved Figs.3&4B embodiment, i.e., to "[obtain] averaged torque at the motor" (Nakada, abstract) and "a uniform torque" (translation, p.6).

Applicant argues that Sasaki teaches away from the slot shape/disposition of Nakada due to the differing slot interval of Sasaki (Fig.1). However, applicant does not consider the entire reference. In Sasaki, embodiments five (Fig.15), nine (Fig.25) and fourteen (Figs.36-37), as well as the prior art (Figs.58&59) show uniform slot intervals. In these and other embodiments, efficiency is improved, for example, by providing different radial slot lengths (p.5:15-20) or different slot-to-magnet hole distances (p.6:9-12) or smaller flux holes than magnet retaining holes (p.8:25-p.9:5). The nature of what applicant considers a "teaching away" is simply one of many various embodiments disclosed by Sasaki for improving the efficiency of the motor. It has been held that "the prior art's mere disclosure of more than one alternative does not constitute

a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed...." *In re Fulton*, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

Regarding applicant's arguments with respect to claim 3, as noted above, Sasaki's embodiment of a progressive slot spacing does not consist of a teaching away since other embodiments in Sasaki teach constant slot spacing.

Regarding claim 5, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this case, while Nakada alone does not teach permanent magnets, the combination of Nakada and Sasaki would fulfill the claimed limitation.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,



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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 571-272-2029.

The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Burton S. Mullins  
Primary Examiner  
Art Unit 2834

bsm  
06 Feb 2007